The role of cultural dimensions of international and Dutch students on academic and social integration and academic performance in the Netherlands

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Abstract

A common belief among educators is that international students are insufficiently adjusted to higher education in their host country, both academically and socially. Furthermore, several groups of international students experience considerable amounts of stress while adapting to the culture of the host-institute, but limited research has addressed whether and how transitional issues influence academic performance. In a cross-institutional comparison among 1275 students at nine higher educational institutes in the Netherlands, differences in academic performance between Dutch and international students were identified by focussing on their levels of academic and social integration. Students' academic integration was measured with the Students' Adaptation to College Questionnaire (SACQ), while students' social integration was measured by the Social Integration Questionnaire. Afterwards, 757 international students from 52 countries were clustered into nine geographical clusters using Hofstede's cultural dimension scores.

The results indicate that some groups of international students experience considerable personal-emotional and social adjustment issues, while other groups of international students adjust fairly straightforward. In particular, international students from Confucian Asia score substantially lower on academic integration than their Western peers, with moderate to strong effect sizes. The cultural dimensions of Hofstede significantly predicted academic adjustment and social adjustment, in particular power-distance (negative), masculinity and uncertainty avoidance (both positive). Follow-up multi-level analyses show that academic adjustment is the primary predictor for academic success. The results imply that higher educational institutes should focus on facilitating academic adjustment of (Bachelor) international students, in particular non-Western students.

1. Introduction

An increasing number of students prefer to study at a university abroad (Healey, 2008; Russell, Rosenthal, & Thomson, 2010). In 2007, 3 million students studied abroad, which is almost three times higher compared to the figures of 1990 (Ministerie van OCW, 2010). Until recently, primarily Anglo-Saxon countries like the U.S., UK or Australia attracted large numbers of foreign, international, students. More recently, also non-English speaking countries such as Germany or the Netherlands are increasingly attracting international students. For example, Geert Hofstede and colleagues developed the first International Management program at Maastricht University (one of institutes in this study) in the Netherlands in 1987 (Maastricht University, 2010). In order to create an international classroom environment that resembled the multi-cultural business environment of many multi-national companies, attracting sufficient number of international students from different cultural backgrounds was considered as an essential success criterion for this program. After the initial success of the

International Management program, several Dutch universities and other European universities rapidly followed this example.

A large body of research has found that substantial cultural differences exist even within small geographic areas, such as Europe (Hofstede, 1986; Joy & Kolb, 2009; Kivinen & Nurmi, 2003; Tempelaar, Rienties, Giesbers, & Schim van der Loeff, 2012). Furthermore, there are substantial differences in the dominant instructional formats and pedagogical models across Europe (Kivinen & Nurmi, 2003). For example, (even just) moving from Germany, which on average has a more traditional approach to teaching in secondary and higher education, to the Netherlands, which has a more student-centred approach to learning in secondary and higher education, may require a different learning style and approach from German students (Hofstede, 2001; Tempelaar et al., 2012; Tempelaar, Rienties, & Gijselaers, 2007).

International students attending education at a host university may experience a culture shock when the educational organisation, behaviours and expectations of the host university is different from those of the students' culture (Zepke & Leach, 2005; Zhou, Jindal-Snape, Topping, & Todman, 2008). De Vita (2001, p. 167) refers to this as cultural learning style, "which re-proposes learning as a culturally-based phenomenon may then explain why teaching methods, learning tasks and environments which promote learning in some cultures may be ineffective in others".

Ward and Kennedy (1993) found that psychological and sociocultural adjustment for international students was easier when they make a relatively small cross-cultural transition (e.g. from Germany to the Netherlands) rather than a large cross-cultural transition (e.g. from China to the Netherlands). Babiker, Cox and Miller (1980) refer to this notion as cultural distance, whereby international students with similar values will experience less stress when studying in a foreign country than students with different values. For example, in a comparison amongst 533 students' learning styles across seven countries, Joy and Kolb (2009) found that the preference for a particular learning style is significantly predicted by the cultural dimensions of Hofstede (2001). Our own research (Tempelaar et al., 2012) amongst 5664 first-year business students shows that cultural dimensions significantly predict the preference of (international) students for the use of ICT versus face-to-face learning in a blended, (basic) mathematics course. In other words, depending on the

similarities and differences of cultures, some groups of international students may find it easier to adjust and adapt to the culture of the host institute, while other groups of international students may experience more adaptation issues, which may affect academic performance.

The prime goal of this article is to characterise the typical differences in academic and social integration between Dutch and international students in nine higher educational institutes in the Netherlands. Both local (Dutch) and international students will experience academic and social transitional issues in the transfer to higher education (Rienties, Beausaert, Grohnert, Niemantsverdriet, & Kommers, 2012; Zhou et al., 2008), but we expect that for some groups of international students these transitional issues will be stronger than for others. This circumstance justifies to include Dutch students in our empirical analyses, and provide them the function of "reference group": students for which transitional issues are expected to be lower than any other group. A large body of research on internationalisation in higher education is descriptive, conceptual and/or policy-driven (Zepke & Leach, 2005; Zhou et al., 2008). Studies that are informed by evidence focus either on a single institute analysis (e.g. Eringa & Huei-Ling, 2009; Russell et al., 2010; Sherry, Thomas, & Chui, 2010; Skyrme, 2007; Ward, Okura, Kennedy, & Kojima, 1998), address adaptation processes either on a first-year Bachelor level or post-graduate Master level (Rienties, Luchoomun, & Tempelaar, 2013), and/or analyse and compare a (relatively) small number of cultures (e.g. Eringa & Huei-Ling, 2009; Ward, Leong, & Low, 2004). Furthermore, many of these studies use rather simplistic statistical methods such as t-test comparisons and correlation analyses, and/or aggregate international students in a single category (De Vita, 2001), rather than acknowledging that the culture of students is strongly influenced by prior education and learning style (Hofstede, 1986; Joy & Kolb, 2009; Tempelaar et al., 2012).

Therefore, in this study we will perform a large scale study with 757 international students from 52 countries from nine geographical clusters and 512 Dutch students at nine universities using multilevel regression modelling in order to understand the impact of cultural dimensions on academic and social integration. A particular new element of our research is that we are able to distinguish the academic and social integration processes of 959 Bachelor and 323 Master students, as adaptation to university is not a linear process (Ward et al., 1998; Zhou et al., 2008). Furthermore, we assess

whether cultural dimensions, as measured by Hofstede (1986), and differences in academic and social integration between Dutch and international students actually have an impact on academic performance, as measured by grade point average scores (GPA) and European Credit Transfer and Accumulation System points obtained (ETCS) after their first year of study.

2. Cultural dimensions, academic and social integration

2.1. Hofstede's Cultural dimensions in higher education

A strong diversity in languages, very different national educational systems, and cultural heterogeneity make Europe an outstanding case in order to compare the impact of cultural diversity. According to the GLOBE study (House, Hanges, Javidan, Dorfman, & Gupta, 2004), no less than five out of ten different cultural clusters existing worldwide are located within Europe. Any European university with a truly diverse inflow of students is inevitably confronted with the need to accommodate diversity in prior knowledge, diversity in students' learning approaches, and cultural diversity (De Vita, 2001; Joy & Kolb, 2009; Rienties, Grohnert, Kommers, Niemantsverdriet, & Nijhuis, 2011; Rienties, Kaper, et al., 2012; Tempelaar et al., 2012).

In the characterisation of cultural dimensions, research by Hofstede (1986, 2001) takes a prominent position. Based on an analysis of attitude survey questions obtained from employees in more than 50 countries, Hofstede identified five major dimensions on which cultures differ: power-distance, individualism–collectivism, masculinity–femininity, uncertainty avoidance, and long-term–short-term orientation. *Power-distance* refers to the extent to which less powerful members of organisations and institutions accept and expect unequal distribution of power. *Individualism versus collectivism* signals the degree to which individuals are integrated into groups: from loose ties between individuals, and everyone expected to look after themselves and immediate family, to people being integrated into strong, cohesive in-groups. In *masculinity-femininity*, emotional gender roles are rather distinct in masculine societies, whereas in feminine societies these roles overlap. *Uncertainty avoidance* refers to society's tolerance for uncertainty and ambiguity, indicating the extent to which members of a culture feel threatened by ambiguous and uncertain situations. The fifth and most recent

cultural dimension of *long-term orientation* distinguishes societies in being directed towards future rewards, or the fulfilment of present needs and desires.

While the original aim of Hofstede's research was to investigate the impact of cultural dimensions on leadership styles, the cultural dimensions identified by Hofstede appeared to impact learning and teaching as well: see e.g. Hofstede (1986), Barmeyer (2004), Jippes and Majoor (2008), Joy and Kolb (2009), Yamazaki (2005) and our own research (Rienties, Luchoomun, et al., 2013; Tempelaar et al., 2012). In strongly masculine countries like Germany and Japan, education is characterized by competition, openly striving for excellence, taking the best students as the norm, and regarding failure as a disaster. In feminine countries like the Netherlands and Nordic European countries, the average student is the norm. Excellence is something one keeps to oneself, and failure is at most an unlucky incident, which can provide useful feedback for a next step in learning (Hofstede, Hofstede, & Minkov, 2010; Tempelaar et al., 2012).

Students from strong uncertainty-avoidance countries, like Germany, prefer structured learning situations with precise objectives, detailed assignments, and teachers in the role of experts. In contrast, in weak uncertainty-avoidance countries such as the Netherlands and the Nordic European countries the teacher may say 'I do not know', learning situations tend to be open-ended, assignments and objectives more broadly defined (Hofstede et al., 2010). An immediate consequence of this interplay of cultural dimensions and learning-related activities is that the optimal design of educational systems does have important dependencies on cultural backgrounds of that society. For example, a student-centred approach such as Problem-Based Learning (Eringa & Huei-Ling, 2009; Jippes & Majoor, 2008; Tempelaar et al., 2012) is an example of a learning and teaching paradigm that may suit students familiar with low power-distance, and weak uncertainty avoidance. In other words, student-centred learning may be more appropriate for societies that are characterized by such a constellation of cultural dimensions, as the Netherlands, and Nordic European and Anglo-Saxon countries. For example, research by Jippes and Majoor (2008) amongst 132 medical schools in 17 European countries indicates that power-distance and uncertainty avoidance were negatively related with the implementation of an integrated PBL curriculum.

In contrast, teacher-centred education best fits high power-distance and strong uncertainty avoidance situations (Eringa & Huei-Ling, 2009; Volet & Ang, 1998; Zhou, Topping, & Jindal-Snape, 2011), as e.g. existing in Eastern European, Latin and Confucian Asian countries. For example, in a study conducted in Australia, Volet and Ang (1998) found that when Asian and Australian (host) students were forced to work in student-centred methods like team-learning, these students preferred to work in teams with co-nationality students. Volet and Ang (1998) found that cultural differences between international and host students were considered detrimental for effectively working together (H1 – H2). In a large classroom teaching setting in the UK using a pre- and post measurement of social learning and friendship networks amongst 207 international and host post-graduate business students, Rienties et al. (2013) found that international and host students primarily interacted with co-nationality students. In line with H3 - H4, motivating students by applying individual competition in classes is most effective in masculine, individualistic societies, as to be found in the USA and German speaking countries, and less in more feminine and egalitarian oriented countries, as again Netherlands and Nordic European countries (Hofstede et al., 2010). Given that international students in the context of this study had to academically and socially adjust to a Dutch higher educational system, which is relatively strongly student-centred, with a low power-distance between students and academic staff, and learning tasks and assessments tend to be open-ended and focussed and deep-level understanding and application (H5 –H6), international students who were familiar with different learning constellations may experience some adjustment issues. Therefore, the following hypotheses were formulated:

H1 Power-distance is negatively related to academic and social integration (as measured by SACQ and SIQ, see also section 2.2).

H2 Power-distance is negatively related to academic performance (as measured by GPA and ECTS).

H3 Masculinity is negatively related to academic and social integration.

H4 Masculinity is negatively related to academic performance.

H5 Uncertainty avoidance is negatively related to academic and social integration.

H6 Uncertainty avoidance is negatively related to academic performance.

Hofstede's framework for cultural dimensions is more recently refined in a series of studies of the GLOBE (Global Leadership and Organizational Effectiveness) research program: House et al. (2004). The GLOBE project identified nine cultural dimensions by investigating the relation between culture and leadership styles, and created ten clusters of world cultures transcending national boundaries. These measures found their way to educational research into the role of cultures: see for example Joy and Kolb (2009). In our empirical study, we will apply the Hofstede cultural dimensions since these provide a more extensive coverage over countries, but will make use of the GLOBE culture clustering into the ten cultural regions of Germanic Europe, Nordic Europe, Eastern Europe, Latin Europe, Anglo, Middle East, Southern Asia, Confucian Asia, Latin America, and Sub-Saharan Africa.

2. 2. Academic and Social integration of (international) students

A large number of studies have addressed student retention or persistence in higher education in general (Wilcox, Winn, & Fyvie-Gauld, 2005; Zepke & Leach, 2005) and of international students in particular (Morrison, Merrick, Higgs, & Le Métais, 2005; Rienties, Beausaert, et al., 2012; Rienties et al., 2011; Russell et al., 2010; Zhou et al., 2008). The interaction student attrition model of Tinto (1975) considers that students have a variety of educational experiences, competences and skills, values as well as family and community backgrounds. As a result, both individual and social attributes will influence the student's integration into higher education. According to Tinto (1975), students not only need to persist in their study in order to graduate (i.e. academic integration), but they also need to participate in the student culture, both within and outside the immediate context of the learning environment (i.e. social integration).

In line with Tinto's interaction model, Baker and Siryk (1999) detected academic and social integration to be influential on study performance. Baker and Siryk (1999) distinguish four concepts in academic integration: academic-, social-, personal- & emotional adjustment and attachment. *Academic adjustment* refers to the degree of a student's success in coping with various educational demands such as motivation, application, performance and satisfaction with the academic environment. *Social adjustment* describes how well students deal with the interpersonal-societal demands of a study, such

as making friends, being part of social activities or being able to work in groups. The *personal and emotional adjustment scale* indicates the level of psychological and physical distress while adapting to the local academic way-of-life. Finally, *attachment* reflects the degree of commitment to the educational-institutional goals. In a large number of studies in U.S. colleges, the four concepts of academic integration (H7 – H10) appear to be positively related with study progress and study performance (Baker & Siryk, 1999; Credé & Niehorster, 2012).

H7 Academic adjustment is positively related to academic performance.
H8 Social adjustment is positively related to academic performance.
H9 Personal-emotional adjustment is positively related to academic performance.
H10 Attachment is positively related to academic performance.

Current research indicates that institutes and the social networks of students have a large influence on how students adjust (Christie, Munro, & Fisher, 2004; Sherry et al., 2010; Tinto, 1998; Zepke & Leach, 2005; Zhou et al., 2008). Based upon an extensive literature review on the concepts of student retention (Baker & Siryk, 1999; Beyers & Goossens, 2002) and acculturation and adaptation (Berry, 1999; Ward et al., 2004; Zhou et al., 2008), Rienties et al. (2012; 2011) extended the model of Baker & Siryk (1999) with three additional social integration factors that are specifically relevant for international students, namely: Perceived reputation of institute by the social network of students; social support by family and friends; and social life.

The *Perceived reputation of institute*, that is the perceived esteem or reputation of the faculty/institute by family, friends, the general public and future employers, influences the social integration of students (Gloria, Castellanos, Lopez, & Rosales, 2005; Thomas, 2002). For example, Ozga and Sukhnandan (1998) found that non-completing students had a lower compatibility with the institute, which was in part caused by less compatible social networks (H11). Second, *Social support*, that is the role of the family on the attitudes and motivation of students has been consistently found in educational psychology (Ozga & Sukhnandan, 1998; Severiens & Wolff, 2008; Zhou et al., 2008). In line with H12, students who complete higher education often state that their social networks provided

sufficient support in order to continue (Christie et al., 2004; Ozga & Sukhnandan, 1998). Third, the *Social life* outside the academic environment has a strong influence on academic integration and academic performance (H13). Having a sufficient number of friends from the same culture as well as host-culture (Montgomery & McDowell, 2009; Neri & Ville, 2008; Rienties, Heliot, et al., 2013; Sherry et al., 2010), sharing accommodation with other students (Neri & Ville, 2008; Ward et al., 1998), being member of a study association, student fraternity or joining a sports club can influence social integration and finally increase academic performance (Ozga & Sukhnandan, 1998; Russell et al., 2010; Severiens & Wolff, 2008). This allows students to establish a social life that is closely attached to the university setting (Tinto, 1998).

Again, cumulated research findings from previous research enable the formulation of research hypotheses. In doing so, we acknowledge that in comparison to Master students first-year Bachelor students may need a larger academic and social integration effort as they are unfamiliar with higher education (H14). However, (international) Master students who followed Bachelor education in their home country may (still) need to adjust their learning style to the academic and social community at the host institute. Therefore, the following hypotheses were formulated:

H11 Perceived reputation of institute is positively related to academic performance.

H12 Social support is positively related to academic performance.

H13 Social life is positively related to academic performance.

H14 Academic and social integration is easier for Master students than for Bachelor students

3. Methods

3.1 Participants

In this research, academic and social integration was compared among nine higher educational institutes in the Netherlands. As highlighted by Hofstede and others, the Dutch culture and the higher educational system in particular can be characterised as individualistic, feminine and egalitarian, whereby there is a low power-distance between students and academic staff, the teacher is easily

approachable and commonly Dutch higher educational institutes use a student-centred approach of teaching. All institutes that participated in this research have extensive experience of providing education to international students. Furthermore, these institutes offer extensive introduction programs for (international) students, and have academic support structures (i.e. buddies, coaching, online summer course programs) in place, as recommended by Zhou et al. (2008) and Rienties, Kaper et al. (2012). The nine institutes use a range of active or small-class size learning methods such as Problem-Based Learning, Project work and/or competency-based education. 44% of the respondents were female and 41% of the respondents had a Dutch citizenship. 77% of the participants followed a business programs, followed by education (14%), engineering (7%), and others (2%). Respondents were assured that their individual responses and particular institutions would not be identified in any published account of the results.

3.2. Procedure

The integrated SACQ and SIQ (see below) questionnaire was distributed among 2446 full-time (i.e. no exchange students) Bachelor and Master students at the nine higher educational institutes after 6-8 months of study. The participating institutes selected programmes within their institute that were taught in English with a large proportion of international students. In total 23 programmes in business (business, hospitality, economics, marketing), education, engineering and science were targeted. In eight institutes, data were collected in class on paper without a teacher present, all data were send to an external researcher at Institute A. One institute collected the data in an online format. After removing incompletely filled in questionnaires, the answers of 1375 (56%) students were initially included in the dataset of this study.

3.3. Measurements

3.3.1. Cultural dimensions

69 nationalities were present in the dataset. The assignment of students to cultural dimensions was based on nationality data available, whereby for 51 countries the cultural dimension scores of Hofstede were available. In addition, scores for Latvian and Lithuanian students were based upon calculations by Huettinger (2008). As a result, for 1275 students cultural dimensions scores were

available, whereby the largest group of international students came from Germany (35%), followed by China (4%), Belgium (3%), Poland, France, USA, Indonesia and Iran (each 1%). In the adoption of the Globe Culture Clusters framework, two refinements were made. First, the cluster Germanic Europe was subdivided into the Netherlands and the German-speaking countries in Europe (Germanic), both to do justice to the size of the main two groups, and to account for relative large differences in secondary schooling and educationally relevant cultural dimensions amongst these subgroups (Tempelaar et al., 2012; Tempelaar et al., 2007). With regard to this last argument: although the Netherlands and Germany are both classified within the European Germanic cluster according to the GLOBE study, the two countries score rather opposite on two cultural dimensions important for education: masculinity-femininity and uncertainty avoidance (Hofstede et al., 2010; Tempelaar et al., 2012). Second, Globe Clusters with less than 10 students were removed from the analysis: Nordic Europe. Table 1 contains the resulting culture clustering of students in the sample, based on the nationality of the students.

→ *Insert Table 1 about here*

3.3.2. Student Adaptation to College Questionnaire

Based upon the student persistence model of Tinto (1975), students' academic integration was measured by the Student Adaptation to College Questionnaire (Baker & Siryk, 1999), which consists of 67 items and is divided into four scales, namely: academic adjustment; social adjustment; personal-emotional adjustment; and attachment. A meta-review of applications of the U.S. developed SACQ questionnaire (Credé & Niehorster, 2012) amongst 237 studies (two of which include international students) of almost 45000 students in the US indicate that SACQ is an appropriate measurement of student's adaptation processes and study performance of US students. Subsequent applications amongst 368 first-year students in Belgium (Beyers & Goossens, 2002) and 858 first-year international and Dutch students in the Netherlands (Franssen & Nijhuis, 2011) and our own research (Rienties, Beausaert, et al., 2012; Rienties et al., 2011) have confirmed that SACQ is also useful in a European context. Cronbach alphas of the four scales ranged between .82-.85, whereby the detailed score equivalence per GLOBE cluster are illustrated in Appendix 1. Taking a cut-off point of $\alpha < 0.6$,

two scales for Sub-Saharan Africa and one for Latin American students indicated poor reliability, which however might be due to low sample sizes.

3.3.3. Social Integration Questionnaire

Students' social integration was measured by our own developed questionnaire (SIQ, Rienties et al., 2011) and validated by confirmatory factor analysis amongst 429 first-year international business students also included in this dataset (For detailed results, see Rienties, Beausaert, et al., 2012). SIQ consists of 12 items, divided into three constructs, namely: perceived reputation of institute; study support; and student's satisfaction with social life. Cronbach alphas of the three scales ranged between .76-.79, whereby two alphas indicated poor reliability (one again for Sub-Saharan students, and one for Anglo-Saxon students which was on the border of .60, see Appendix 1). Therefore, the interpretation of findings for students from the Sub-Saharan cultural cluster requires reticence.

3.3.4. Academic performance

The academic performance of the participating students was assessed by taking into account the number of ECTS credits (a regular program contains 60 ECTS per year) obtained after one year of study, as well as the student's grade point average after one year (GPA). In total, 74% of the ID-numbers could be linked with the academic performance data of the administrative systems. Data protection policies at three institutes (sample size of 223 or 18%) prohibited data aggregation of academic performance.

3.4. Data analysis

First, analysis of Variance (ANOVA) explored differences between the various Culture Clusters based on the GLOBE framework. Given the large sample size, rather than relying solely on standard significance tests, we also measured effect sizes whereby partial eta-squared (η^2) were calculated, where 0.01 constitutes a small effect, 0.06 a medium effect and 0.14 a large effect. Where eta-squared values are reported, the differences in means were statistically significant at a 5% level at least. Second, correlation analyses explored the relation between the SACQ, SIQ components, Hofstede's cultural dimensions as measured on a country-level, students' grades and ECTS. As the main analytical step, multi-level regression-analyses (see below) were conducted in order to identify

whether cultural dimensions predicted the SACQ and the SIQ components as well as students' grades and the obtained study credits (ECTS), and whether the combination of cultural dimensions, the SACQ and the SIQ components predicted students' performances.

In order to account for the hierarchical nature of our data collection, with individual students shaping the first level, and nation-based culture clusters shaping the second level, the regression analyses were of multilevel type, allowing for random intercepts. Following Heck, Thomas, and Tabata (2010), Nezlek (2011), and Twisk (2006), we first derived a null-model or no predictor model (Model 0), and from that model, determined intraclass correlations (ICC's). Next, we derived two sets of individual-level random intercept models: regression models explaining the SACQ scales, the SIQ scales, and the two students' performances indicators by a random intercept, a dummy for master studies, and the three Hofstede dimensions power-distance (PDI), masculinity (MAS), and uncertainty-avoidance (UAI) (indicated as Model 1). Subsequently, we derived regression models explaining the two students' performances scores by a random intercept, the dummy for master studies, the three Hofstede dimensions PDI, MAS, and UAI, combined with the SACQ and SIQ scales (indicated as Model 2). As our prime interest was in the fixed regression coefficients, rather than the random intercept, we followed Twisk (2006) in using the maximum likelihood (ML) method, rather than the restricted maximum likelihood (REML) method. In all regressions, we applied grand-mean centring by transforming the predictor variables into their z-scores, with the exception of the single dummy variable (Heck et al., 2010; Nezlek, 2011; Twisk, 2006).

As a preliminary step to the empirical analysis, the two instruments SACQ and SIQ were investigated whether they measure equivalent constructs in the several country clusters (Van de Vijver & Leung, 1997, 2011; Van de Vijver & Poortinga, 2002). Structural equivalence was tested using exploratory factor analysis, following procedures described in e.g. Celenk, Van de Vijver, and Goodwin (2011), Van Osch and Breugelmans (2012), and Breugelmans, Van de Vijver, and Schalk-Soekar (2009).

Due to strong representation of students from the several Germanic countries in our sample, and the circumstance these Germanic national cultures score rather similar on the three Hofstede dimensions of power-distance, individualism and long-term orientation, the data set of individual

Hofstede scores exhibits collinearity (which is evident from Table 3, where correlations of these three dimension scores range, in absolute value, between .76 and .82). In order to apply regression models, this collinearity issue has to be solved, either by applying factor analysis in order to combine the three dimension scores, or alternatively, by selecting one of the three dimensions in the regression as predictor of the outcome variables. Given that long-term orientation data is only available for 31 out of 53 countries, and that the individualism dimension score does not correlate with academic performance, we opted to include power-distance in the regression model to represent the set of collinear cultural dimension, which is illustrated in Table 4 and Table 5.

Gender was expected to be a potential covariate in the several regression models. However, due to privacy restrictions of several institutions, the data set for gender was incomplete so that we could not include gender as individual level variable in our model. However, in the institutions allowing to collect gender data, we checked for the role of gender and it appeared to be limited: beyond personal-emotional adjustment, gender did not have a statistically significant impact on any of the other variables. Since gender data were available for six of the nine institutions, but missing for three, we opted for full institutional coverage and did not include gender in the multi-level analyses.

4. Results

4.1. Descriptive results

Distinguishing international students into nine different cultural clusters provides a more in-depth understanding of the dynamics of student adaptation than aggregating international students into a single category. In Table 2, the descriptive statistics of the academic and social integration indicators according to Globe clusters are illustrated, as well as ANOVAs and eta-squared effect sizes. With respect to the SACQ indicators, academic adjustment (3.40) is the lowest average score of four scales, followed by personal-emotional adjustment, social adjustment and finally attachment to the institute (3.90). With respect to the SIQ instrument, students' satisfaction with social life has the lowest average score (3.36), followed by the perceived reputation of institute and study support by family and friends (4.01), whereby the effect sizes for SACQ and SIQ indicators across geocultural clusters are small to moderate in size.

→ Insert Table 2 about here

➔ Insert Figure 1 about here

On average, students from Europe score similar to local Dutch students, although Germanic students score significantly lower on personal-emotional adjustment and significantly higher on perceived reputation of institute in comparison to Dutch students using ANOVA with post-hoc test applying Bonferroni corrections, which is illustrated in Figure 1. With respect to international students coming from outside Europe, students from Confucian Asia score significantly lower on all SACQ scales except academic adjustment and perceived reputation of institute.

4.2. Structural equivalence

Structural equivalence of the instruments SACQ and SIQ was checked using factorial methods. In order to reduce the amount of tests and to accommodate smaller sample sizes as reported in Table 1, we created four regional clusters at aggregated level: Germanic Europe, The Netherlands, Asia, and Other regions (See also Van Osch & Breugelmans, 2012). Next, we checked whether unifactorial solutions were adequate for all combinations of the seven scales and the four aggregate regional clusters (Celenk et al., 2011). The proportion of explained variation by the unifactorial solutions range from 22% for the longer scales (Academic and Social adjustment) to 75% for the shorter scales (Attachment and Perceived reputation of institute). Third, for all possible pairs of regional clusters, and for all scales, the Tucker's Phi coefficients were calculated on the basis of the component matrix of the principal component analyses. Of these 42 Tucker's Phi values, all but one are well above .95, the indicator of strong evidence for factorial equivalence (Breugelmans et al., 2009; Van de Vijver & Leung, 1997). The last value of Tucker Phi equals .90, indicating that none of the tests result into nonnegligible incongruity (Van de Vijver & Leung, 1997).

4.3. Academic adjustment and cultural dimensions

Table 3 shows the results for the correlation analyses and indicates that the four subscales of the SACQ have high significantly positive intercorrelations, as was found in previous research (Baker & Siryk, 1999; Beyers & Goossens, 2002; Credé & Niehorster, 2012). Furthermore, there are significantly positive correlations between the SACQ scales and the social integration scales, and amongst the SIQ scales, as was already reported by Rienties, Beausaert et al. (2012). Finally, the power-distance, individualism and long-term orientation dimensions of Hofstede are only weakly intercorrelated (removing the strong correlations by reducing the set of predictor variables to only three cultural dimensions).

→Insert Table 3 about here

The power-distance index of Hofstede (2001) is negatively correlated to all SACQ scales except academic adjustment, indicating that students from cultures with strong power-distance between individuals in society, such as Indonesia, score lower on social, personal-emotional adjustment and attachment towards the institute, thus providing mixed support for H1. Students from cultures where lecturers have strong authority and power and use teacher-centred approaches may feel less well-adapted in a student-centred setting, whereby Dutch lecturers expect active participation from all students.

The individualism index is positively correlated to all SACQ scales except academic adjustment, indicating that cultures that are more individualistic, such as the UK, tend to have higher academic integration scores. The masculinity index is negatively correlated to personal-emotional adjustment, but positively to perceived reputation of institute, indicating that students from cultures that are more masculine, such as Italy, tend to have to overcome more personal-emotional issues, given that the culture in the Netherlands is characterised by Hofstede as feminine, providing (partial) support for H3. In contrast to H5, the uncertainty avoidance index is positively correlated with all SACQ scores except personal-emotional adjustment, as well as perceived reputation of institute and study support by family and friends. This might indicate that students with strong uncertainty

avoidance, such as France or Germany, who prefer a structured learning environment with a teacher-centred approach, appear to be better adjusted. Finally, long-term orientation is negatively correlated with all SACQ and SIQ scales, indicating that students from countries with long-term orientation such as China or South Korea face more academic and social adjustment issues than students from countries with short-term orientation, such as Germany.

With regard to students' performances, the average grade after one year (GPA) is significantly positively correlated with academic adjustment (H7), personal-emotional adjustment (H9), attachment (H10), and students' satisfaction with social life (H13). Furthermore, the average grade is positively correlated with the masculinity index (-H4), uncertainty avoidance index (-H6) and negatively correlated with power-distance (H2) and long-term orientation, whereby a negative sign in front of the hypotheses indicated a significant effect but in the opposite (expected) direction. The average number of credits obtained after one year (ECTS) only correlates with academic adjustment (H7), attachment (H10) and the perceived reputation of institute (H11). With respect to the cultural dimensions, ECTS is negatively correlated with power-distance (H2) and long-term orientation, while ECTS is positively correlated with masculinity index (-H4) and uncertainty avoidance index (-H6).

4.4. Multilevel regression analyses

The main outcomes of the nine null-models, having random intercepts only, are contained in the first part of Table 4. The ICC column indicates that intraclass correlations are generally modest in size. Only three cases, those of Social Adjustment, Attachment, and Perceived reputation of institute, have ICC levels above 5%, suggesting restricted homogeneity of the several cultural clusters, with Attachment being the major exception. The Wald Z-tests of the intercept variance strengthen the impression that variation in intercepts over cultural clusters is limited: none of the test statistics achieves a significant value.

➔ Insert Table 4 about here

The second part of Table 4 contains statistics from the several Model 1's: the random intercept model with predictors. Predictors in this model are restricted to a dummy or indicator variable for

master students (with Bachelor students being the reference group), and the three Hofstede dimensions of power-distance (PDI), masculinity (MAS), and uncertainty-avoidance (UAI). In line with H14, the main predictor of academic performance is the dummy variable of Master students, who are significantly better adjusted, both academically and personal-emotionally, but have significant lower perceived reputation of institute, as well as expectations about social support by their family and friends. The role of cultural dimensions is somewhat less substantial. The impact of power-distance, if significant, is uniformly negative (H2), whereas the impact of uncertainty avoidance is uniformly positive, which is in contrast to H6. Masculinity has a mixed impact: as expected negatively on SACQ and SIQ scales (H3), however positively on student performance (-H4). The likelihood ratio test, based on the difference in log likelihoods between the models with, and without predictor variables, signals the cases where the extension of the random intercept model with fixed predictors variables significantly increases predictive power. This is true for six out of the nine cases, with Social Adjustment, Attachment, and Social Life being the exceptions.

➔ Insert Table 5 about here

In the final step, the regression models explaining students' performance are extended with SACQ and SIQ scales as fixed predictor variables: Model 2, contained in Table 5. Likelihood ratio tests compare Model 2 with Model 1, and indicate that the addition of SACQ and SIC predictor variables has a significant impact on predictive power. However, only one scale is responsible for this increased predictive power: academic adjustment (H7). In Table 7, the results of the hypotheses tested and confirmed are illustrated.

→ Insert Table 7 about here.

5. Conclusion and discussion

In this study, we investigated how cultural dimensions of 1275 students from 53 countries at nine higher educational institutes in the Netherlands influenced academic integration, social integration and

academic performance using multi-level regression analyses. A common assumption among educators is that academic and social integration of international students are not yet well-articulated in the policies and practices of Western institutes for higher education (Sherry et al., 2010; Zhou et al., 2008). In order to gain a perspective on this (perceived) lack of adjustment, this study identified the underlying factors for international students' successful or failing integration and academic performance by focussing on Hofstede's notion of cultural dimensions, whereby we clustered 757 international students into the nine geographical clusters of the GLOBE study.

A main significant finding is that academic and social integration processes of international students are far more complex than just talking about "THE international student". That is, we found significant and substantial differences in academic and social integration processes between the nine groups of international students. European students score similar to local Dutch students on academic adjustment, which is the key predictor for academic performance (see below). However, in particular Germanic students experience some significant personal-emotional adjustment issues, which may be attributed to their lower satisfaction of social life. As was found by our initial research (Rienties et al., 2011), international and Dutch students live in relatively separate social worlds. Dutch (Bachelor) students are more likely to become member of a student fraternity and work part-time. International students (due to Dutch language barriers) are less likely to work beside their studies, primarily join study-related associations and meet socially with other international students with the same language as well as with other international students (Rienties et al., 2011).

With respect to international students coming from outside Europe, students from Latin America and Middle East score similar to local students. Students from Southern Asia and in particular Confucian Asia score significantly lower on academic and social adjustment, indicating that Confucian students in our context have to overcome substantial transitional barriers when studying in the Netherlands. This finding has been found in other contexts as well (Eringa & Huei-Ling, 2009; Volet & Ang, 1998; Ward & Kennedy, 1993; Ward et al., 2004). That is, using a fine-grained analysis of following seven international students in the UK, Montgomery and McDowell (2009) showed that international students primarily interact with other international students. In a study amongst 207 post-graduate business students in a large classroom using pre-post social friendship and learning network

analysis, Rienties et al. (2013) found that international and host students have limited links to each other. Finally in an Australian context, Neri and Ville (2008) found that international students have a tendency to develop relations with co-national students. Although co-national friendship networks provide (short-term) support through social interaction with international students who are experiencing similar emotions, Kim (2001) argues that it will hinder adaptation processes in the long-run.

A second main finding is that the cultural dimensions of Hofstede significantly predict all seven scales of academic and social adjustment, which in turn predict academic adjustment and academic performance. Students from countries with stronger power-distance have more academic and social adjustment issues and less commitment or attachment with the host institute. Furthermore, students from countries with stronger power-distance perform significantly lower in terms of academic performance than students from countries that have lower power-distance. As most of the nine institutes in our analysis use student-centred approaches such as Problem-Based Learning, Project-Based Learning and/or Competence-Based learning, whereby students are expected to actively participate in- and outside class, students from high power-distance cultures who typically are more familiar with teacher-centred approaches face larger adaption issues than students from low power distance cultures, and so obtained lower grades and less study credits after one year of study, indicating a less successful academic transition.

The masculinity index positively predicts the perceived reputation of institute, satisfaction with social life, and average grades. This may initially be an unexpected result, as the Netherlands is characterised by Hofstede as a feminine country. A possible explanation is that in strongly masculine countries like Germany or Japan, education is characterised by competition, whereby students are openly striving for excellence (Hofstede et al., 2010). In contrast, in the Netherlands the average student is the norm, whereby most Dutch students are satisfied when they score 60-70% on an exam. Sticking to their own cultural norms of striving for the best academic result is thus benefiting international students from more masculine oriented cultures than for Dutch students. At the same time, students from masculine oriented cultures experience more personal-emotional adjustment issues and receive less study support from friends and family.

Students from countries with strong uncertainty avoidance have more commitment towards the host institute and indicate to be better supported by family and friends, which in turn leads to better academic performance than students from countries with weak uncertainty avoidance such as the Netherlands. Again, this may sound counterintuitive, since high uncertainty avoidance represents a mismatch between educational principles and students' characteristics. Previous research has found that students from high uncertainty avoidance countries prefer a strongly structured learning environment (Hofstede, 2001; Tempelaar et al., 2012), whereby teachers are experts in the field. This seems to be in contrast with the learning environments offered by most of the nine institutes. However, uncertainty avoidance suggests to be another example, beyond masculinity, where such a mismatch is more of a help, than an obstacle for international students. International students with strong uncertainty avoidance will try to minimise any risks of not being successful, even or maybe especially when having to participate in a (rather distinctly different) student-centred learning environment. We found evidence for this suggestion in own study (Tempelaar et al., 2012), whereby we investigated students' learning preferences in a blended learning environment, consisting of Problem-based learning face-to-face tutorials, supplemented with online learning to support students in need for additional learning options. In that study, uncertainty avoidance demonstrates to be one of the main predictors of the intensity of online learning. Furthermore, in our own research amongst 1700 Dutch vs. 2800 international first-year business students using an online program to remediate mathematics knowledge gaps (Tempelaar et al., 2012), whereby a lot of responsibility was given to students to self-study, we found that students from countries with strong uncertainty avoidance are working harder in the mathematics program than students with low uncertainty avoidance.

Finally, irrespective of cultural backgrounds and educational system differences, we found that the best predictor for academic performance is academic adjustment. In other words, the extent to which students adapt to the academic way-of-life in terms of motivation, learning style, drive and/or study approach is the key driver for academic success. In other words, when students are motivated, capable and have adjusted their learning style to the host institute, students are more likely to successfully study and perform at Dutch universities, irrespective of their cultural backgrounds.

5.1. Constraints and Limitations

A first limitation of this research is that we used self-reported scores of students on academic and social integration. Besides the known issues with using self-reported scores, groups or persons who are "at risk" might not have returned the questionnaire or would have filled in the questionnaire in a socially desirable manner. However, by distributing the validated questionnaires in class on paper in eight out of nine universities, we were able to compare academic and social integration in a large sample of first-year Bachelor and Master students, which strengthens our findings in comparison to studies using a single-institute analysis or a comparison among various disciplines of study (Mannan, 2007; Severiens & Wolff, 2008). Alternative methodological approaches, such as following actual international student interactions as done by Montgomery and McDowell (2009), conducting focus groups (Volet & Ang, 1998), or using social network analyses of friendship and learning relations amongst international and host student (Neri & Ville, 2008; Rienties, Heliot, et al., 2013) might provide additional insights how international and host students develop academic and social integration strategies.

A second limitation of this research is that not for all of the 53 countries in our dataset sufficient cases were present for each country or for each geographical cluster. Although a large number of Dutch and German students and to a lesser degree Chinese, Belgian, Polish, French and U.S students were present in our dataset, data from 29 countries was only present for less than three students per country. Therefore, we clustered the 53 nationalities into ten geographical clusters based upon the GLOBE study of House et al. (2004). Nonetheless, in particular for the geographical clusters of the Middle East, Sub-Saharan Africa and Latin America 25 students or less were present. Therefore, our findings with respect to these three clusters and interpreting findings on a country-level should be treated with caution. Furthermore, recent findings indicate that alternative conceptualisation of cultural dimensions, such as the Schwartz Value Survey (Fischer, Vauclair, Fontaine, & Schwartz, 2010), may provide alternative insights beyond Hofstede's cultural dimensions. A final limitation is that of 104 non-Western students studying at three institutes whose administration policies did not allow academic study performance scores to be linked to research. Therefore, we are not able to conclude whether these international students were able to overcome their initial lower academic and social integration.

In future research, it would be interesting to enhance our understanding of the dynamics how international students cope with the pressures of academic and social integration. For example, to what extent do abilities in English language (Sherry et al., 2010), development of co-national and mixed-national friendships (Rienties, Heliot, et al., 2013), the relative size of the group of co-national students (Kim, 2001; Zhou et al., 2011), the design of the curriculum (Jippes & Majoor, 2008), influence how international students build learning relations with other students and academic staff that helps or hinders them to adapt and adjust their learning style and academic adjustment to the host institute. Research by Ward et al. (1998) and our own research (Rienties, Heliot, et al., 2013; Rienties, Hernandez Nanclares, Jindal-Snape, & Alcott, 2013) seems to indicate that the complexities or how (groups of) international students develop strategies to adjust over time are subtle, thereby requiring longitudinal and dynamic analyses.

6. Practical implications

Most institutes for higher education provide several introduction activities and social support structures for new students in order to facilitate their academic and social integration. Based upon our findings, rather than focussing purely on social integration (such as welcoming parties, movie nights or bus tours to touristic highlights) and understanding the university community (Sherry et al., 2010), we encourage higher educational institutes to specifically address activities that can enhance academic adjustment of bachelor (international) students, in particular for international students coming from cultures with strong power-distances. As Master students have significantly higher SACQ scores in comparison to Bachelor students, in particular academic adjustment scores (which in our context is a primary predictor for academic performance), our results indicate that institutes should focus their support activities primarily to international (non-Western) Bachelor students. This can for example be done by providing more information about the (student-centred) educational culture of the institute before international students move to the host university. Even better would be allowing international students to experience the educational learning approach of the host institute before starting with their Bachelor program, thereby allowing international students to gauge and compare their (cultural) learning style with the (expected though often not explicitly explained) learning style at the host

institute. In particular, by focusing on the expected domain-specific knowledge, language proficiency, skills and attitudes before the start of the academic program, institutes can actively enhance the awareness of international students of the demands of higher education. Research at one of the participating institutes (Rienties, Tempelaar, Van den Bossche, Gijselaers, & Segers, 2009; Rienties, Tempelaar, Waterval, Rehm, & Gijselaers, 2006) has found that providing online summer courses for international students in economics or mathematics not only enhances their domain-specific knowledge but also provides a social network for international students at the institute itself.

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9. Appendix Cronbach alphas per GLOBE geocultural cluster

Cluster	Academic Adjustment	Social Adjustment	Personal-Emotional adjustment	Attachment	Perceived reputation of institute	Study Support	Student's satisfaction social life	Average
Anglo-Saxon	.840	.734	.708	.806	.574	.656	.768	.726
Latin Europe	.788	.838	.822	.825	.790	.771	.793	.804
Germanic Europe	.823	.846	.856	.841	.774	.823	.798	.823
The Netherlands	.829	.820	.852	.827	.727	.697	.771	.789
Eastern Europe	.852	.792	.770	.785	.801	.737	.790	.790
Latin America	.804	.423	.610	.643	.622	.651	.733	.641
Sub-Saharan Africa	.281	.846	.312	.821	.374	.870	.878	.626
Middle East	.758	.757	.776	.801	.752	.845	.830	.789
Southern Asia	.885	.836	.794	.873	.780	.702	.729	.800
Confucian Asia	.795	.787	.774	.774	.620	.735	.820	.758
Total	.827	.845	.847	.847	.766	.757	.788	.811

Table 1

Culture clusters of students, based on refined Globe clustering

Cluster	#students	Countries (samples, and ordered by frequency)
Anglo-Saxon	19	USA, UK.
Latin Europe	70	Belgium, France, Spain, Portugal, Italy.
Germanic Europe	430	Germany, Austria.
The Netherlands	512	The Netherlands.
Eastern Europe	49	Poland, Greece, Lithuania, Romania, Ukraine, Russia.
Latin America	25	México, Brasil, Surinam, Venezuela, Perú.
Sub-Saharan Africa	14	Ethiopia, Nigeria, Tanzania.
Middle East	13	Afghanistan, Turkey, Morocco.
Southern Asia	45	Indonesia, Iran, India, Bangladesh.
Confucian Asia	93	China, Vietnam, Taiwan.

Note: Countries listed per Globe geocultural region are most common occurring countries in our dataset.

Table 2

Comparison of academic and social integration across GLOBE indicators

	Academic adjustment	Social adjustment	Personal-emotional adjustment	Attachment	Reputation of institute	Study Support	Student's satisfaction with social life
Total	3.40	3.47	3.47	3.90	3.77	4.01	3.36
	0.51	0.57	0.70	0.59	0.73	0.84	0.72
Anglo-Saxon	3.34	3.62	3.71	3.87	3.53	4.02	3.57
	0.63	0.57	0.52	0.66	0.73	0.76	0.76
Latin Europe	3.40	3.39	3.38	3.78	3.74	4.20	3.25
	0.45	0.55	0.63	0.58	0.68	0.84	0.73
Germanic Europe	3.40	3.52	3.40	4.01	4.12	4.02	3.39
	0.47	0.57	0.72	0.56	0.66	0.85	0.75
The Netherlands	3.40	3.52	3.62	3.94	3.55	4.01	3.45
	0.51	0.52	0.70	0.56	0.72	0.82	0.64
Eastern Europe	3.52	3.42	3.36	3.91	3.65	4.08	3.21
	0.54	0.54	0.65	0.53	0.83	0.80	0.74
Latin America	3.51	3.51	3.37	3.96	3.87	4.19	3.39
	0.47	0.58	0.59	0.57	0.55	0.84	0.63
Sub-Saharan Africa	3.75	3.23	3.46	3.94	3.93	4.21	2.89
	0.55	0.85	0.57	0.58	0.47	1.09	1.02
Middle East	3.56	3.73	3.54	3.84	3.74	3.66	3.54
	0.64	0.66	0.58	0.62	0.65	1.16	1.00
Southern Asia	3.42	3.37	3.32	3.79	3.74	4.08	3.17
	0.59	0.60	0.72	0.66	0.61	0.72	0.73
Confucian Asia	3.23	3.11	3.10	3.34	3.51	3.70	3.06
	0.51	0.59	0.60	0.58	0.63	0.79	0.78
ANOVA	2.491**	6.450***	7.033***	12.746***	20.392***	2.379**	4.186***
η^2	0.017	0.044	0.048	0.083	0.127	0.017	0.051

Note: The first row for each GLOBE geocultural region represents the mean scores, while the second row represents the standard deviations.
ANOVA F-Test based on GLOBE indicators. For comparison, both SACQ and SIQ are illustrated on scale 1-5.
***Coefficient is significant at the 0.001 level (2-tailed).
**Coefficient is significant at the 0.01 level (2-tailed).

Table 3

Correlation analysis of the different variables involved in the study

Scale	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*
1. Academic adjustment	1												
2. Social adjustment	.47**												
3. Personal-emotional adjustment	.53**	.42**											
4. Attachment	.63**	.82**	.47**										
5. Perceived reputation of institute	.24**	.28**	.11**	.31**									
6. Study support	.17**	.21**	.05	.24**	.31**								
7. Students' satisfaction with social life	.17**	.45**	.14**	.36**	.27**	.18**							
8. Power-distance Index	-.01	-.16**	-.14**	-.22**	-.10**	-.03	-.15**						
9. Individualism index	.01	.15**	.17**	.20**	-.03	.06*	.10**	-.82**					
10. Masculinity index	-.02	-.05	-.18**	-.03	.27**	-.01	.10*	.22**	-.49**				
11. Uncertainty avoidance index	.07**	.08**	-.02	.13**	.18**	.11**	.09**	-.03	.06*	.24**			
12. Long-term orientation index	-.09**	-.19**	-.13**	-.29**	-.19**	-.10**	-.11**	.82**	-.77**	.02	-.76**		
13. Average grade (GPA)	.24**	.06	.09**	.10**	.05	-.04	.08*	-.08*	-.04	.13**	.11**	-.12**	
14. Study points collected after one year (ECTS)[1]	.19**	.04	.06	.13**	.07*	-.02	.06	-.12**	.04	.13**	.15**	-.15**	.28**

*$p < .05$. **$p < .01$.

[1]Only Bachelor scores are computed as not all Master students had completed their final thesis when the data was aggregated, thereby leading to spurious correlations.

Table 4

Multi-level Regression analyses of SACQ and SIQ and cultural dimensions

	Model 0				Model 1						
	B_0	ICC	WaldZ	-2 log likelihood	B_0	B_{Master}	B_{PDI}	B_{MAS}	B_{UAI}	-2 log likelihood	Likelihood ratio test
Academic Adjustment	3.43***	.027	1.14 ns	1897	3.36***	0.18***	-0.02 ns	0.00 ns	0.03*	1866	31***
Social Adjustment	3.43***	.058	1.64 ns	2121	3.46***	0.04 ns	-0.08***	-0.02 ns	0.05***	2115	6 ns
Personal-Emotional Adjustment	3.40***	.037	1.63 ns	2694	3.42***	0.19***	-0.10***	-0.09***	0.01 ns	2661	33***
Attachment	3.84***	.104	1.82 ns	2205	3.84***	0.06 ns	-0.05 ns	0.03 ns	0.04 ns	2200	5 ns
Perceived reputation of institute	3.74***	.063	1.84 ns	2686	3.76***	-0.16***	0.00 ns	0.05 ns	0.08*	2668	18***
Social Support	4.03***	.015	1.02 ns	3162	4.08***	-0.24***	0.03 ns	-0.06*	0.10***	3131	31***
Social Life	3.31***	.034	1.43 ns	2458	3.37***	0.00 ns	-0.08***	-0.05*	0.03 ns	2452	6 ns
GPA	6.89***	.025	1.36 ns	2453	6.86***	0.38***	-0.09**	0.16***	0.07 ns	2424	29***
ECTS	50.2***	.047	1.46 ns	7599	53.4***	-19.1***	-1.51***	1.19**	1.01*	7301	298***

Table 5

Multi-level Regression analyses of GPA and ECTS on cultural dimensions, and academic and social adjustment

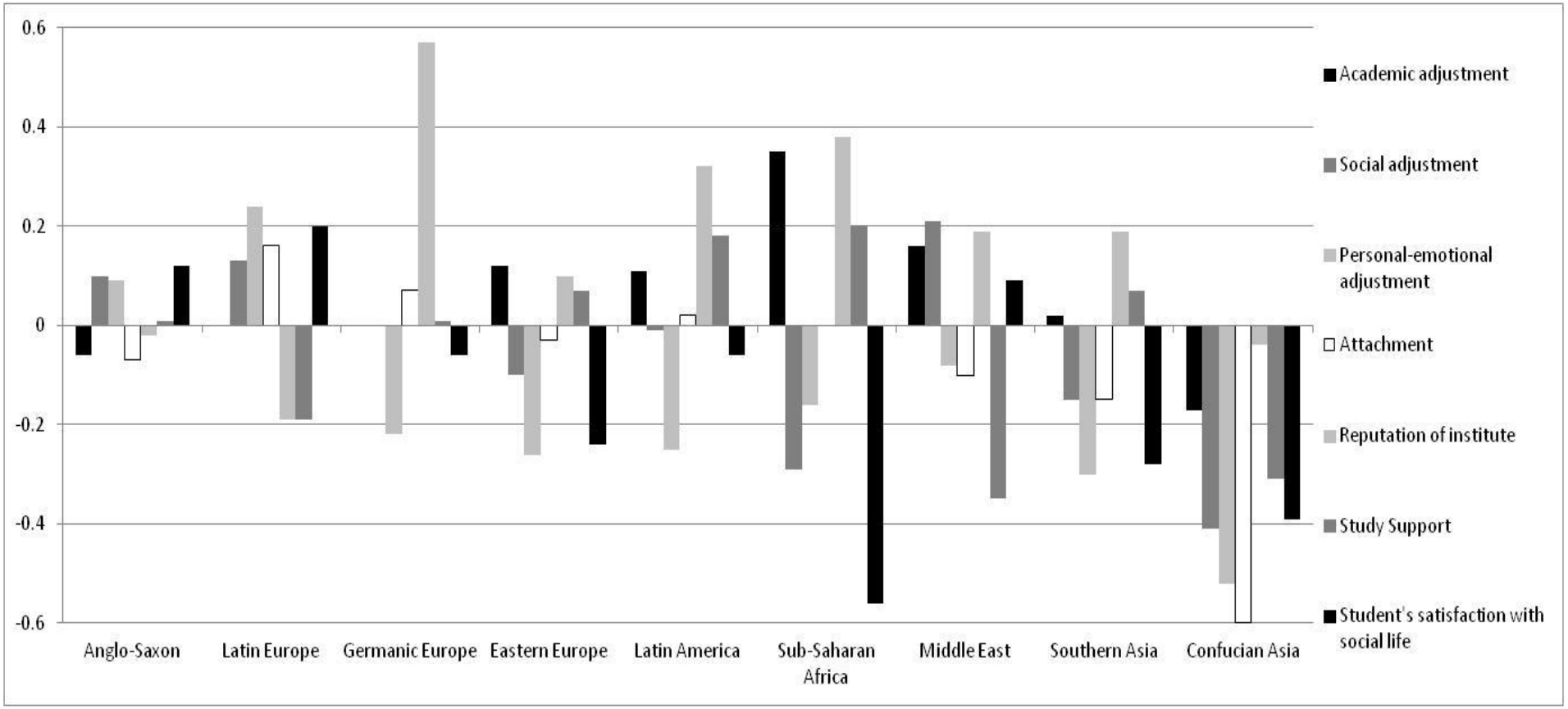
	Model 2													
	B_0	B_{Master}	B_{PDI}	B_{MAS}	B_{UAI}	B_{AcAd}	B_{SAd}	B_{PAd}	B_{At}	B_{REP}	B_{SocSup}	B_{SocLif}	-2 log likeli-hood	Likelihood ratio test
GPA	6.88	0.27	-0.11	0.14	0.07	0.25	-0.02	-0.01	-0.00	0.01	-0.05	-0.04	2153	271***
	***	***	**	***	ns	***	ns	ns	ns	ns	ns	Ns		
ECTS	48.2	-24.4	2.09	2.68	1.10	2.36	-2.17	0.16	0.92	-0.69	0.00	0.79	6357	944***
	***	***	ns	ns	ns	***	*	ns	ns	ns	ns	ns		

Table 6

Confirmed and rejected hypotheses

H	Input	Dependent Variable(s)	Confirmed/rejected
1	Power-distance (neg)	Academic and Social Adjustment	(Partially) confirmed: academic adjustment; personal-emotional adjustment; social life
2	Power-distance (neg)	Academic performance	(Partially) confirmed: average grades (but not number of credits obtained)
3	Masculinity (neg)	Academic and Social Adjustment	(Partially) confirmed: personal-emotional adjustment; social support; social life
4	Masculinity (neg)	Academic performance	Rejected: masculinity positively predicts average grades
5	Uncertainty avoidance (neg)	Academic and Social Adjustment	Rejected: uncertainty avoidance positively predicts academic adjustment, social adjustment, reputation of institute, and social support
6	Uncertainty avoidance (neg)	Academic performance	Rejected: no significant relation
7	Academic adjustment	Academic performance	Confirmed: academic adjustment primary predictor for academic performance
8	Social Adjustment	Academic performance	Rejected: social adjustment negatively predicts number of credits obtained.
9	Personal-emotional adjustment	Academic performance	Rejected: no significant relation
10	Attachment	Academic performance	Rejected: no significant relation
11	Perceived reputation of institute	Academic performance	Rejected: no significant relation
12	Social Support	Academic performance	Rejected: no significant relation
13	Social Life	Academic performance	Rejected: no significant relation
14	Master	Academic performance	(Partially) confirmed: academic & personal emotional adjustment; average grades negatively predicts reputation of institute; social support.

Figure 1 Academic and Social integration of international students relative to Dutch students



Note: a score above zero denotes a better academic or social integration score in comparison to Dutch students, while a score below zero denotes a lower score.